MI930/MI930F

AMD Athlon™ 64 / Athlon™ 64 x2
(Dual Core) / Sempron™
Mini-ITX Motherboard

USER'S MANUAL

Version 1.0

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Introduction

Product Description

The MI930 Mini ITX board incorporates the Mobile AMD M690T Express Chipset for Embedded Computing, consisting of the AMD M690T (North Bridge) and SB600 (South Bridge), an optimized integrated graphics solution with an 800MHz front-side bus. Dimensions of the board are 170mm x 170mm.

The M690T integrates an ATi Radeon X700-based graphics engine supporting dual display, an LVDS interface, an integrated TMDS controller, and operates at core speeds of up to 400 MHz. MI930 features a low-power design, is validated with the AMD Athlon™ 64 / Athlon™ 64 x2 (dual core) / Sempron™ on 65nm process. With two dual channel DDR2 800MHz DIMM sockets on board, the board supports up to 4GB of DDR2 system memory.

The main features of the board are:

- Supports AMD Athlon™ 64 / Athlon™ 64 x2 (dual core) / Sempron™
- Supports up to 2.8GHz, 800MHz FSB
- Two DDR2 SDRAM DIMM, Max. 4GB memory
- 2x Marvell PCI-Express Gigabit LAN
- AMD M690T Express VGA for CRT / LVDS / DVI
- 2x SATA, 6x USB 2.0, 2x COM, Watchdog timer
- 1x PCI slot (expansion to two PCI slots)

Checklist

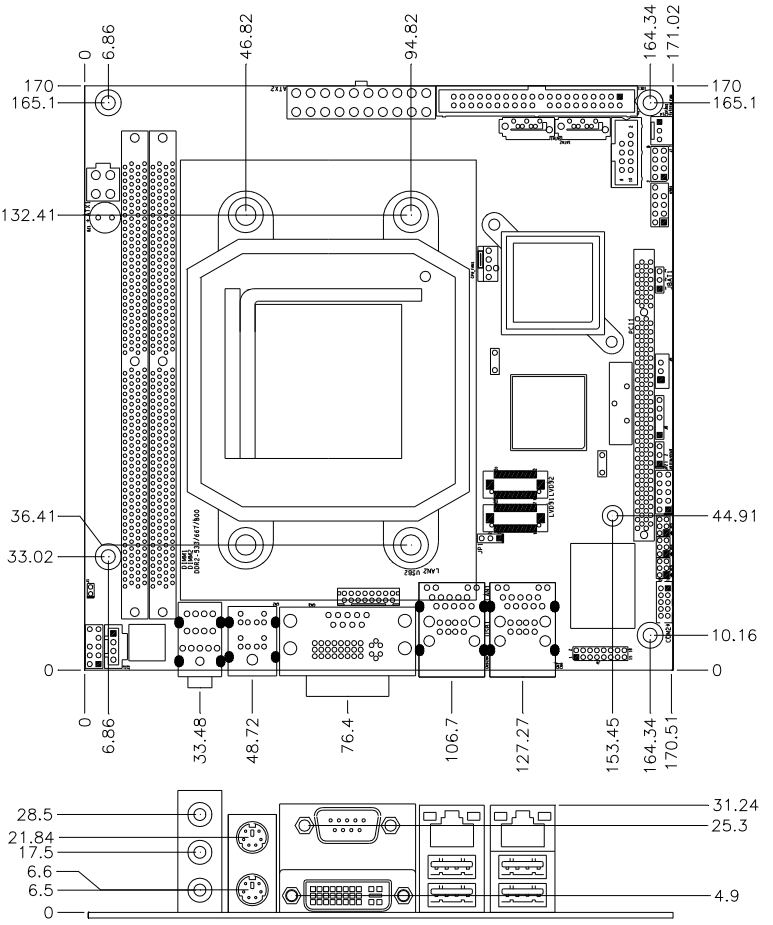
Your MI930 package should include the items listed below.

- The MI930 Mini-ITX motherboard
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Cable kit (IDE, Serial port, Serial ATA)

MI930 Specifications

CPU Supported	AMD Athlon™ 64 / Athlon™ 64 x2 (dual core) / Sempron™ 64-bit processor integrated w/ DDRII memory controller in CPU.
CPU Voltage	0.700V ~ 1.5V
System Speed	Up to 2.8GHz or above
CPU FSB	800MHz FSB
Cache	128K/256K/512K1MB/2MB
Green /APM	APM1.2
CPU Socket	Socket AM2 (940pin)
Chipset	ATI M690T / SB600 chipset NB: M690T, 465-ball FCBGA (21x21mm) SB: ATi SB600, 549-ball FCBGA (23x23mm, 0.8mm pitch)
BIOS	Award BIOS, support ACPI Function
Memory	DDR2 800/667/533 SDRAM DIMM x2 (w/o ECC function), Max. 4GB
VGA	ATi M690T built-in Radeon X700 based graphic engine, supports full DirectX9.0. RS690T integrates TMDS controller for DVI and 18 or 24-bit LVDS interface. Supports dual display for below display combinations: - Analog (CRT) + digital (DVI or LVDS) - Both digital (DVI + LVDS)
LAN	Marvell 88E8053 PCI-e Gigabit LAN controller x2
USB	ATi SB600 built-in USB 2.0 host controller, support 6 ports
Serial ATA Ports	ATi SB600 built-in SATA II (3.0Gb/sec) host controller, supports 2 ports and RAID 0, 1 function
Parallel IDE	ATi SB600 built-in one channel Ultra DMA 33/66/100/133
Audio	ATi SB600 built-in audio controller + AC97 Codec ALC888 w/ 7.1 channels
LPC I/O	W83627EHG: COM1 (RS232), COM2 (RS232/422/485) & hardware monitor (3 thermal inputs, 4 voltage monitor inputs, 2 fan headers). Parallel, IrDA & Floppy not used
Digital IO	4 in & 4 out
Keyboard/Mouse	Supports PS/2 keyboard/mouse connector
Expansion Slots	PCI slot (32bits/33MHz) x1 8x2 pin-header x1 for LPC TPM adaptor card (reserved) or 8x2 pin-header x1 for LPC 2nd I/O adaptor card COM3 /COM4 (RS232) or COM3 /COM4 /COM5 /COM6 (RS232) (reserved)
Edge Connector	PS/2 connector x1 for keyboard/mouse DB9 & DVI stack connector x1 for COM 1 and DVI RJ-45 + dual USB stack connector x2 for LAN1, 2 & USB1~4 RCA jack 3x1 for audio (Line-in, Line-Out, Mic.) & pin header for front panel (Line-Out2, Mic2)
Onboard Header/ Connector	DF13-20 x2 for LVDS 40-pin, 2.54mm, box-header x 1 for IDE1 5x2 pin-header x1 for USB5~6 5x2 pin-header x1 for front audio (headphone & Mic.) 10 pin-header x1 for COM2 8x2 pin-header x1 for VGA
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec/min)
System Voltage	+5V, +3.3V, +12V, -12V, 5VSB (2A)
Others	Modem Wakeup, LAN Wakeup
Board Size	170mm x 170mm (Mini ITX)

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the MI930 in order to set up a workable system. The topics covered are:

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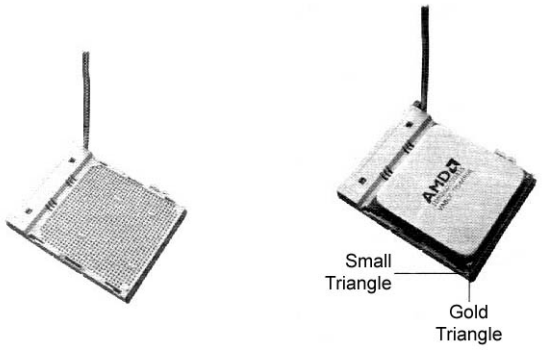
Installing the CPU

The MI930 board supports a Socket AM2 (940-pin) processor socket for AMD Athlon™ 64 / Athlon™ 64 x2 (dual core) / Sempron™ processors. To install the CPU, unlock first the socket by pressing the lever sideways, then lift it up to a 90 degree angle as shown below. Then, position the CPU above the socket such that the CPU corner aligns with the gold triangle matching the socket corner with a small triangle. Carefully insert the CPU into the socket and push down the lever to secure the CPU. Then, install the heatsink and fan.



***NOTE**: Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

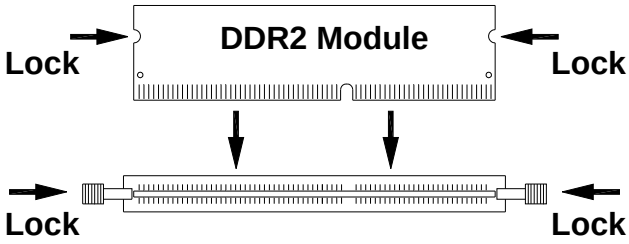
Installing the Memory

The MI930 board supports two DDR2 memory socket for a maximum total memory of 4GB in DDR2 memory type.

Installing and Removing Memory Modules

To install the DDR2 modules, locate the memory slot on the board and perform the following steps:

1. Hold the DDR2 module so that the key of the DDR2 module aligned with that on the memory slot.
2. Gently push the DDR2 module in an upright position until the clips of the slot close to hold the DDR2 module in place when the DDR2 module touches the bottom of the slot.
3. To remove the DDR2 module, press the clips with both hands.



Setting the Jumpers

Jumpers are used on MI930 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MI930 and their respective functions.

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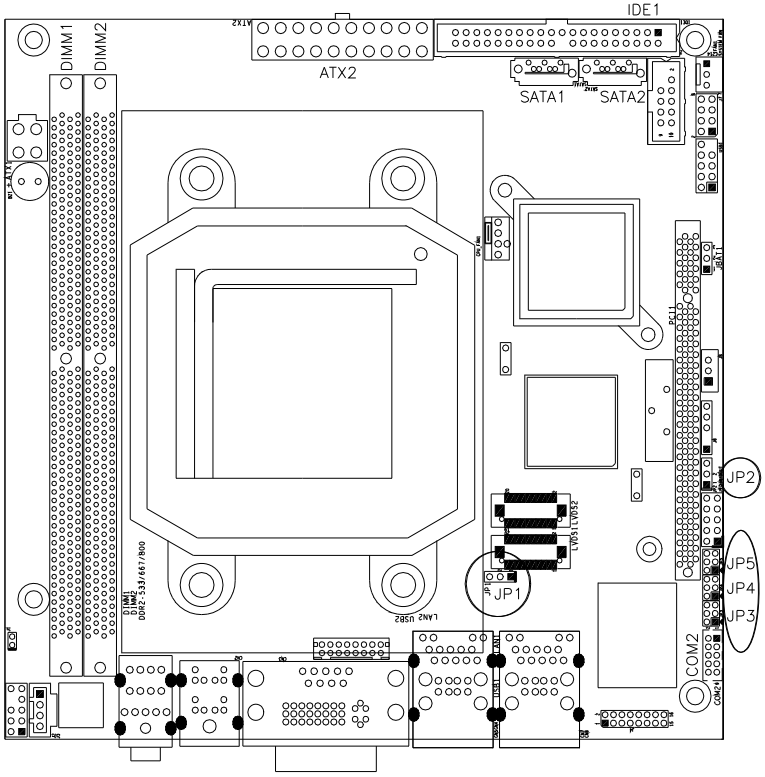
JP1: LCD Panel Power Selection 10
JP2: PCI Riser Card Selection 10
JP3, JP4, JP5: RS232/422/485 (COM2) Selection 11

Jumper Locations on MI930



Jumpers on MI930 .....Page

JP1: LCD Panel Power Selection 10
JP2: PCI Riser Card Selection 10
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JBAT1: Clear CMOS Setting

JBAT1	Setting
	Normal
	Clear CMOS

JP1: LCD Panel Power Selection

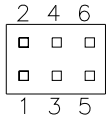
JP1	LCD Panel Power
	3.3V
	5V

JP2: PCI Riser Card Selection

JP2	Riser Card
	IP390 Riser Card Install
	IP151, IP240 Riser Card Install

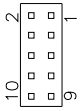
JP3, JP4, JP5: RS232/422/485 (COM2) Selection

COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM2 selection.



COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP5: 1-2 JP4: 3-5 & 4-6 JP3: 3-5 & 4-6	JP5: 3-4 JP4: 1-3 & 2-4 JP3: 1-3 & 2-4	JP5: 5-6 JP4: 1-3 & 2-4 JP3: 1-3 & 2-4

COM2 is jumper selectable for RS-232, RS-422 and RS-485.



Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

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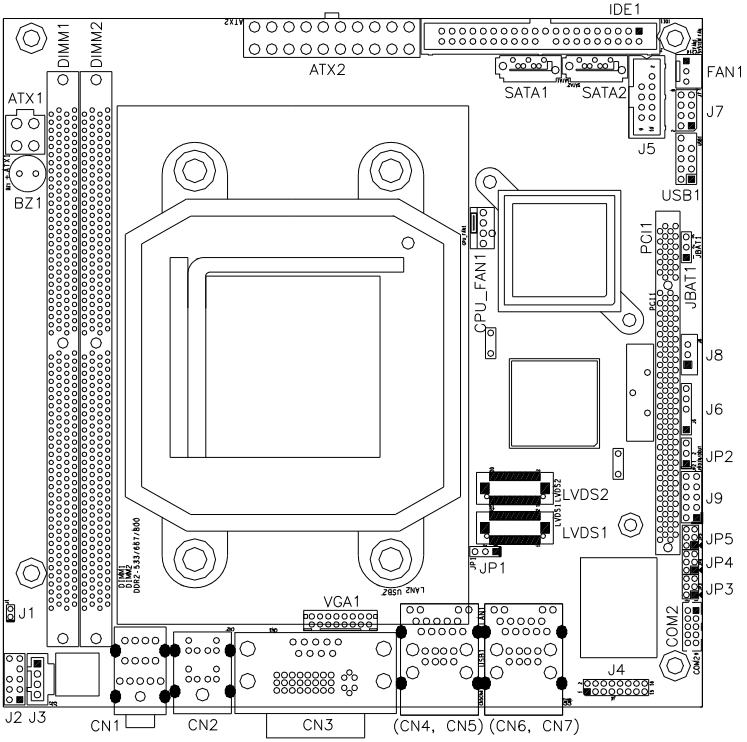
Connector Locations on MI930



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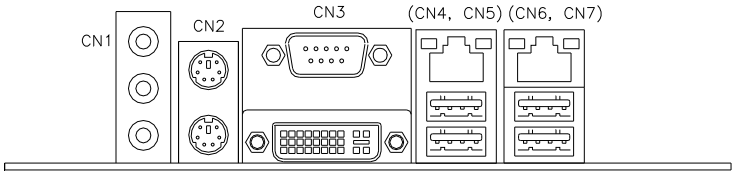
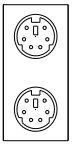


CN1: Audio Connector

CN2: PS/2 Keyboard and PS/2 Mouse Connectors

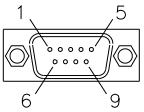


PS/2 Mouse

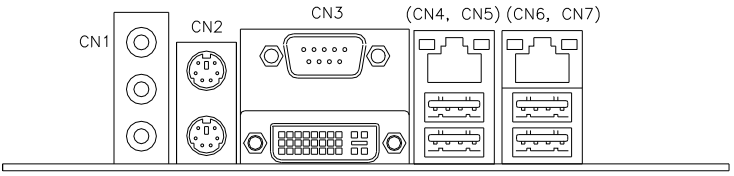
PS/2 Keyboard

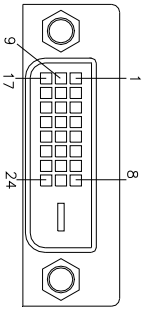
Signal Name	Keyboard	Mouse	Signal Name
Keyboard data	1	1	Mouse data
N.C.	2	2	N.C.
GND	3	3	GND
5V	4	4	5V
Keyboard clock	5	5	Mouse clock
N.C.	6	6	N.C.

CN3: COM1 and DVI-I Connector



Signal Name	Pin #	Pin #	Signal Name
DCD	1	6	DSR
RXD	2	7	RTS
TXD	3	8	CTS
DTR	4	9	RI
GND	5	10	Not Used





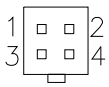
Signal Name	Pin #	Pin #	Signal Name
DATA 2-	1	16	HOT POWER
DATA 2+	2	17	DATA 0-
Shield 2/4	3	18	DATA 0+
DATA 4-	4	19	SHIELD 0/5
DATA 4+	5	20	DATA 5-
DDC CLOCK	6	21	DATA 5+
DDC DATA	7	22	SHIELD CLK
VSYNC	8	23	CLOCK -
DATA 1-	9	24	CLOCK +
DATA 1+	10	C1	N.C.
SHIELD 1/3	11	C2	N.C.
DATA 3-	12	C3	N.C.
DATA 3+	13	C4	N.C.
DDC POWER	14	C5	N.C.
A GROUND 1	15	C6	N.C.

CN4, CN5: GbE RJ45 (MI930) and USB1/2 Ports

CN6, CN7: GbE RJ-45 (MI930F) and USB3/4 Ports

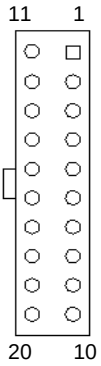
ATX1: ATX 12V Power Connector

This connector supplies the CPU operation voltage



Pin #	Signal Name
1	Ground
2	Ground
3	+12V
4	+12V

ATX2: ATX Power Supply Connector



Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

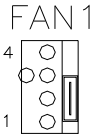
FAN1: System Fan Power Connector

FAN1 is a 3-pin header for system fans. The fan must be a 12V (500mA).

Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

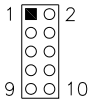
FAN2: CPU Fan Power Connector

FAN2 is a 4-pin header for the CPU fan. The fan must be a 12V fan.



Pin #	Signal Name
4	Control
3	Sense
2	+12V
1	Ground

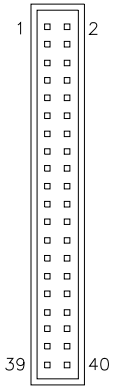
F_USB1: USB0/USB1 Connector



Signal Name	Pin	Pin	Signal Name
Vcc	1	2	Vcc
D0-	3	4	D1-
D0+	5	6	D1+
Ground	7	8	Ground
NC	9	10	Ground

Note: This USB connector is compatible with USB 2.0 devices only.

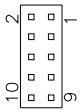
IDE1: IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

SATA1, SATA2: SATA Connectors

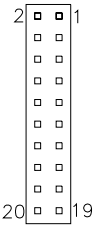
COM2: COM2 Serial Port



Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

LVDS1, LVDS2: LVDS Connectors (1st channel, 2nd channel)

The LVDS connectors on board consist of the first channel (J3) and second channel (J4) and supports 18-bit or 36-bit.



Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
NA	10	9	NA
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

J3: CD-In Pin Header

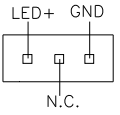
Pin #	Signal Name
1	CD Audio R
2	Ground
3	Ground
4	CD Audio L

J4: For LPC I/F Adaptor Card

ID394 with Fintek F81216, 2 or 4 Serial Ports
ID395 Winbond WPCT200 x1 for TPM1.2

J5: SPI Flash Connector (factory use only)

J6: Power LED Connector



Pin #	Signal Name
1	LED+
2	No connect
3	Ground

J7 (F_PANEL): System Function Connector

ATX Power ON Switch: Pins 1 and 2
This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.

Hard Disk Drive LED Connector: Pins 3 and 4
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.

Pin #	Signal Name
4	HDD Active
3	5V

Reset Switch: Pins 5 and 6
The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.

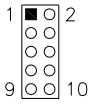
+5V and 5VSB Signals: Pins 7 and 8

Pin #	Signal Name
7	+5V
8	+5VSB

J8: LCD Backlight Connector

Pin #	Signal Name
1	+12V
2	Backlight Enable
3	Ground

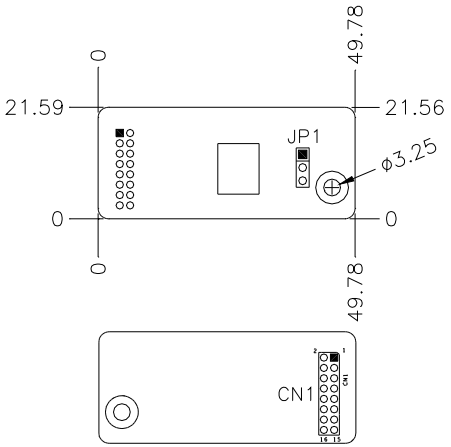
J9: Digital I/O



Signal Name	Pin	Pin	Signal Name
GND	1	2	VCC
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

PCI1: PCI Slot (supports 2 Master)

ID395 WINBOND WPCT200 for TPM1.2

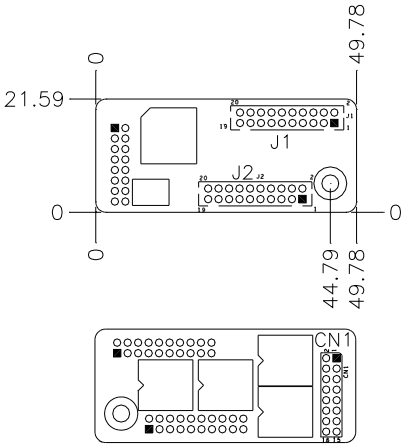


CN1: LPC I/F connectors

Package list

- Nylon Nut x 1
- Screw x 2
- Washer x2

ID394 LPC Serial Ports Adaptor Card



J1 J2: COM3/4/5/6 Serial Ports
J1 - COM3/4 pin-header connector.
PIN1~PIN10 COM3
PIN11~PIN20 COM4
J2 - COM5/6 pin-header connector.
PIN1~PIN10 COM5
PIN11~PIN20 COM6

Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	2	DSR, Data set ready
RXD, Receive data	3	4	RTS, Request to send
TXD, Transmit data	5	6	CTS, Clear to send
DTR, Data terminal ready	7	8	RI, Ring indicator
GND, ground	9	10	Not Used
DCD, Data carrier detect	11	12	DSR, Data set ready
RXD, Receive data	13	14	RTS, Request to send
TXD, Transmit data	15	16	CTS, Clear to send
DTR, Data terminal ready	17	18	RI, Ring indicator
GND, ground	19	20	Not Used

CN1: LPC I/F connectors
Package list:
COM port cable (PK1-20B) x 2
Nylon Nut x 1
Screw x 2
Washer x2

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BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction 24
BIOS Setup 24
Standard CMOS Setup 26
Advanced BIOS Features 28
Advanced Chipset Features 31
Integrated Peripherals 33
Power Management Setup 35
PNP/PCI Configurations 37
PC Health Status 38
Frequency/Voltage Control 39
Load Fail-Safe Defaults 40
Load Optimized Defaults 40
Set Supervisor/User Password 40
Save & Exit Setup 40
Exit Without Saving 40

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports various processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note**: If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:** It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Wed, Apr 28, 2007	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level >
IDE Channel 0 Master	None	Change the day, month,
IDE Channel 0 Slave	None	Year and century
IDE Channel 2Master	None	
IDE Channel 2 Slave	None	
IDE Channel 3 Master	None	
IDE Channel 3 Slave	None	
Halt On	No Errors	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day :	**Sun to Sat**
Month :	**1 to 12**
Date :	**1 to 31**
Year :	**1999 to 2099**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Channel Master/Slave

The onboard PCI IDE connector provides Primary and Secondary channels for connecting up to two IDE hard disks or other IDE devices.

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDING ZONE :	Landing zone
SECTOR :	Number of sectors

Remarks: The main board supports two serial ATA ports and are represented in this setting as IDE Channel 0.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a key-board or disk error; it will stop for all others.

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

CPU Feature	Press Enter	ITEM HELP
Hard Disk Boot Priority	Press Enter	
Virus Warning	Disabled	Menu Level >
USB Hard Disk Boot First	Disabled	
CPU Internal Cache	Enabled	
External Cache	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Hard Disk	
Second Boot Device	CDROM	
Third Boot Device	LS120	
Boot Other Device	Enabled	
Boot Up Floppy Seek	Disabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
HDD S.M.A.R.T. Capability	Disabled	

CPU Feature

Press Enter to configure the settings relevant to CPU Feature.

Hard Disk Boot Priority

With the field, there is the option to choose, aside from the hard disks connected, "Bootable add-in Cards" which refers to other external devices.

Virus Warning

If this option is enabled, an alarm message will be displayed when trying to write on the boot sector or on the partition table on the disk, which is typical of the virus.

CPU Internal and External Cache

Cache memory is additional memory that is faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These allow you to enable (speed up memory access) or disable the cache function.

Quick Power On Self Test
When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device
These fields determine the drive that the system searches first for an operating system. The options available include *Floppy, LS120, Hard Disk, CDROM, ZIP100, USB-Floppy, USB-ZIP, USB-CDROM, LAN* and *Disable*.

Boot Other Device
These fields allow the system to search for an OS from other devices other than the ones selected in the First/Second/Third Boot Device.

Boot Up Floppy Seek
This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system.

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option

This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller. The default setting is ***Enabled***.

MPS Version Control for OS

This option is specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is ***1.4***.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

HDD S.M.A.R.T. Capability

By default, this field is disabled.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		ITEM HELP
DRAM Configuration	Press Enter	
HT Link Control	Press Enter	
PCIE Configuration	Press Enter	
IGX Configuration	Press Enter	
NB Azalia	Disabled	
Memory Hole	Disabled	
System BIOS Cacheable	Disabled	

Phoenix - AwardBIOS CMOS Setup Utility
DRAM Configuration

		ITEM HELP
Timer Mode	Auto	
Memory Clock value or Limi DDR 400		CKE based powerdown
DQS Training Control	Skip DOS	
CKE base power down mode	Enabled	
CKE based power down	Per Channel	
Memclock tri-stating	Disabled	
Memory Hole Remapping	Enabled	
Auto Optimize Bottom IO	Enabled	
Bottom of [31.24] IO space D8		
Bottom of UMA DRAM [31.24]	FC	

Phoenix - AwardBIOS CMOS Setup Utility
HT Link Control

		ITEM HELP
HT Link Width	Auto	
HT Link Frequency	Auto	
HT Driver Strength	Auto	
HT Driver Strength (P)	5	
HT Driver Strength (N)	4	
HT Receiver Ctrl	Auto	
HT Receiver Ctrl Value	9	
HT PLL Control	High Speed	

Phoenix - AwardBIOS CMOS Setup Utility
PCIE Configuration

		ITEM HELP
GFX Link Width	x16	
GFX Overclocking	Disabled	
ASPM GFX	Disabled	
ASPM GPP	Disabled	
ASPM NB-SB	Disabled	
GFX Power Limit, Watt	75	
GPP Power Limit, Watt	25	
Debug Options	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility
Debug Options

		ITEM HELP
GFX Core Payload Size	64 Bytes	
GPP Core Payload Size	64 Bytes	
SB/GPP Port CFG	Auto	
GFX Clock Gating	Enabled	
GPPSB Clock Gating	Enabled	
TMDS Support	On	
NB-SB Virtual Channel	Disabled	
Port Reset Deassert Delay	40	

Phoenix - AwardBIOS CMOS Setup Utility
IGX Configuration

		ITEM HELP
Internal Graphic Mode	UMA	
UMA Frame Buffer Size	128M	
Current UMA Size	128M	
IGX Engine Clock	400	
IGX Multi Function	Disabled	
Video Display Devices	Auto	
LCD Panel Type	Disabled	

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

Onboard Device	Press Enter	ITEM HELP
South OnChip IDE Device	Press Enter	Menu Level >
South OnChip PCI Device	Press Enter	
SuperIO Device	Press Enter	
Init Display First	Onboard	
Surroundview	Disabled	
OnChip USB Controller	Enabled	
USB EHCI Controller	Enabled	
OnChip USB KBC Controller	Enabled	
USB Mouse Support	Enabled	
IDE HDD Block Mode	Enabled	

Phoenix - AwardBIOS CMOS Setup Utility
Onboard Device

Onboard Marvell PCIE NIC 1	Enabled	ITEM HELP
Onboard Marvell PCIE NIC 2	Enabled	
Onboard LAN Boot ROM	Disabled	Menu Level >

Phoenix - AwardBIOS CMOS Setup Utility
South OnChip IDE Device

IDE DMA transfer access	Enabled	ITEM HELP
On-Chip IDE Channel0	Enabled	
Primary Master PIO	Auto	Menu Level >
Primary Slave PIO	Auto	
Primary Master UDMA	Auto	
Primary Slave UDMA	Auto	

Phoenix - AwardBIOS CMOS Setup Utility
South OnChip PCI Device

HD Azalia Audio	Auto	ITEM HELP
OnChip SATA Controller	Enabled	
OnChip SATA Type	Native IDE	Menu Level >
SB600 Spread Spectrum	Enabled	

Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device

POWER ON Function	BUTTON ONLY	ITEM HELP
KB Power ON Password	Enter	
Hot Key Power ON	Ctrl-F1	
Onboard FDC Controller	Disabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
RxD, TxD Active	Hi, Lo	
IR Transmission Delay	Enabled	
UR2 Duplex Mode	Half	
Use IR Pins	IR-Rx2Tx2	
PWRON After PWR Fail	Off	

Power ON Function
This field is related to how the system is powered on – such as with the use of conventional power button, keyboard or hot keys. The default is ***BUTTON ONLY***.

KB Power ON Password
This field allows users to set the password when keyboard power on is the mode of the Power ON function.

Hot Key Power ON
This field sets certain keys, also known as hot keys, on the keyboard that can be used as a 'switch' to power on the system.

Onboard Serial Port
These fields allow you to select the onboard serial ports and their addresses. The default values for these ports are:

Serial Port 1 3F8/IRQ4
Serial Port 2 2F8/IRQ3

UART Mode Select
This field determines the UART 2 mode in your computer. The default value is ***Normal***. Other options include *IrDA* and *ASKIR*.

PWRON After PWR-Fail
This field sets the system power status whether *on or off* when power returns to the system from a power failure situation.

Power Management Setup

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

ACPI Suspend Type	S1(POS)	ITEM HELP
C2 Disable/Enable	Disabled	
Power Management Option	User Define	Menu Level >
HDD Power Down	Disabled	
Video Off Option	Suspend→Off	
Video Off Method	V/H SYNC+ Blank	
Modem Use IRQ	3	
Soft-Off by PWR-BTTN	Instant-Off	
PowerOn by PCI Card	Disabled	
Modem Ring Resume	Disabled	
ACPI XSDT Table	Disabled	
HPET Support	Enabled	
RTC Alarm Resume	Disabled	
Date (of Month)	0	
Resume Time Alarm (hh:mm:ss)	0 : 0 : 0	

ACPI Suspend Type

The default setting of the ACPI Suspend mode is ***S1(POS)***.

Power Management Option

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

HDD Power Down

When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows BIOS to control the video display.
Blank Screen	Writes blanks to the video buffer.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is ***3***.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

PowerOn by PCI Card

By default, this field is disabled.

Modem Ring Resume

This field enables or disables the power on of the system through the modem connected to the serial port or LAN.

HPET Support

HPET, or High Precision Event Timer (formerly known as Multimedia Timer) is a hardware timer that is supported under Linux and Windows Vista. It can produce periodic interrupts at a much higher resolution than the RTC and is often used to synchronize multimedia streams, providing smooth playback and reducing the need to use other timestamp calculations such as an x86 CPU's RDTSC instruction.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

		ITEM HELP
Reset Configuration Data	Disabled	
Resources Controlled By	Auto (ESCD)	Menu Level
IRQ Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	
Assign IRQ For VGA	Enabled	
Assign IRQ For USB	Enabled	
PCI Latency Timer(CLK)	64	
PCI Express Relative items		
Maximum Payload Size	4096	

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices with the use of a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

PCI Latency

PCI latency refers to the number of cycles that any device can hold an IRQ before it is disconnected.

Maximum Payload Size

The default setting of the PCI Express Maximum Payload Size is 4096.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
CPU Warning Temperature	Disabled	
System Temp	45°C/113°F	
CPU Temp	45°C/113°F	Menu Level >
North Bridge Temp	30°C/86°F	
FAN1 Speed	5400 RPM	
FAN2 Speed	5400 RPM	
Vcore(V)	1.02 V	
+12V	12.2 V	
Vmem	1.8V	
+5V	5.13 V	
-12V	11.12V	
3.3V	-12.19V	
VBAT (V)	3.21 V	
3VSB(V)	3.21 V	
1st Smart Fan Temperature	Disabled	
Fan1 Tolerance Value	5	
2nd Smart Fan Temperature	Disabled	
Fan2 Tolerance Value	5	

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the system sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

1st / 2nd Smart Fan Temperature

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

Spread Spectrum	Disabled	ITEM HELP
CPU Host/SRTC/ATIG	Default	Menu Level >

Auto Detect PCI Clk

This field enables or disables the auto detection of the PCI clock.

CPU Host/SRC/ATIG

This field is set to ***Default***.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type “Y”, you will quit the setup utility and save all changes into the CMOS memory. If you type “N”, you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

Drivers Installation

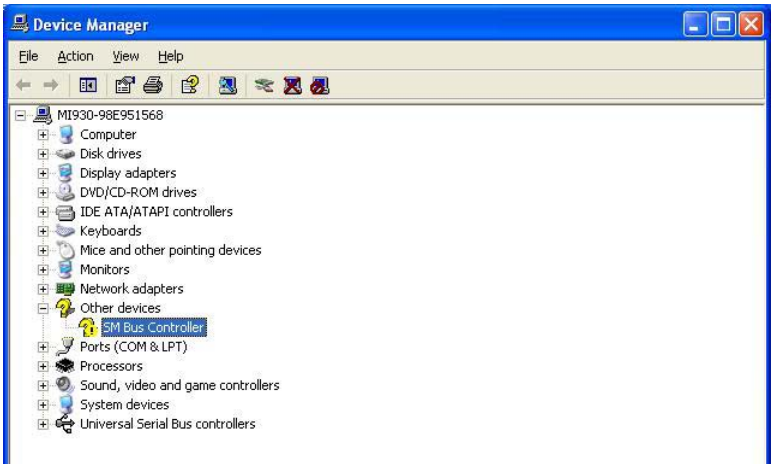
This section describes the installation procedures for software and drivers under the Windows 2000 and Windows XP. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

SM Bus Controller Driver Installation 42
VGA Drivers Installation 45
Realtek Codec Audio Driver Installation 47
LAN Drivers Installation 50

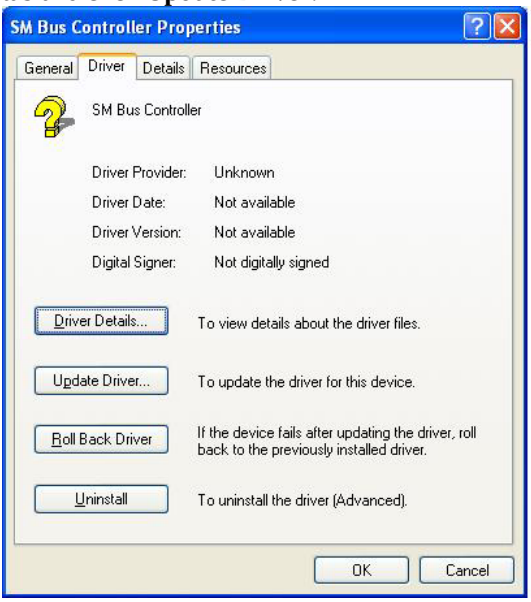
SM Bus Controller Driver Installation

1. In your Windows operating system, go to the **Device Manager**.

2. Double click **SM Bus** Controller which is under **Other devices** as shown in the picture below to go to the **SM Bus Controller Properties** window.



3. Under the **SM Bus Controller Properties** window, click the **Driver** tab and click **Update Driver**.



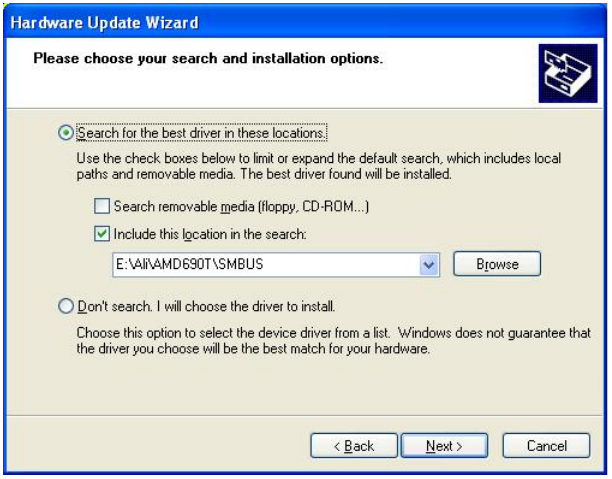
4. When the welcome screen of the **Hardware Update** Wizard appears, click **No, not this** time, and **Next** to continue.

Hardware Update Wizard
Welcome to the Hardware Update Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

5. On the next screen, select **Install from a list or specific location (Advanced)**, and click **Next** to continue.

Hardware Update Wizard
This wizard helps you install software for:
SM Bus Controller
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

6. Select **Search for the best driver in these locations.**, and enter the path where the drivers are located. If E:\ is your CD ROM drive, enter **E:\Ali\AMD690T\SMBUS** or click **Browse** to search for the path.

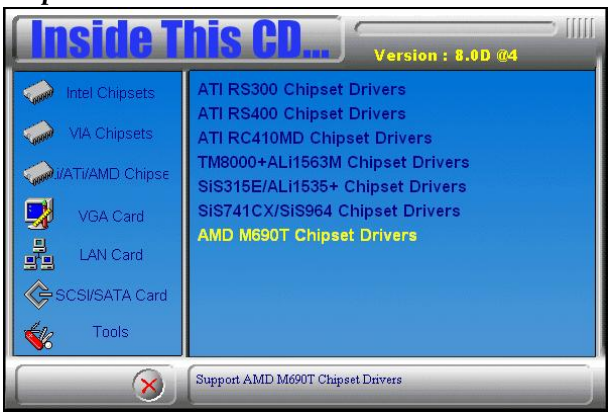

Hardware Update Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
E:\Ali\AMD690T\SMBUS
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

7. When driver installation is complete, click **Finish** for changes to take effect.

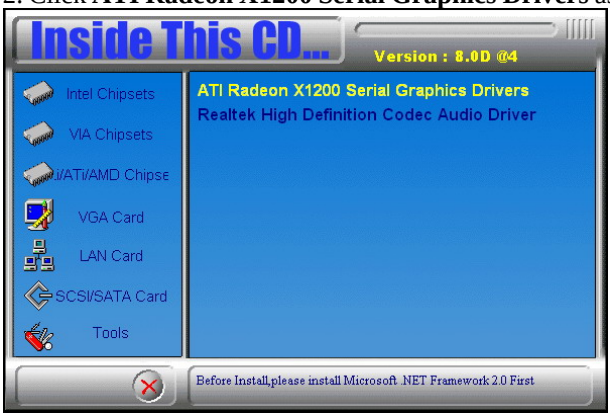
VGA Drivers Installation

To install the VGA drivers, follow the steps below to proceed with the installation.

1. Insert the CD that comes with the motherboard. Click ***AMD M690T Chipset Drivers***.



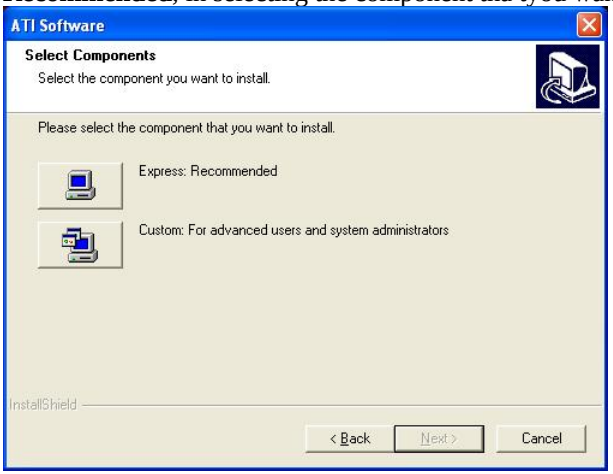
2. Click **ATI Radeon X1200 Serial Graphics Drivers** as shown below.



Remarks: Before installing this driver, you have to install Microsoft NET Framework 2.0. Please go the Microsoft website to do this.

3. In the Welcome screen, click **Next** to continue. Then, in the License Agreement screen, also click **Next** to continue.

4. When the **Select Components** screen appears, click **Express: Recommended**, in selecting the component tha tyou want to install.



5. When the message regarding Windows Logo testing appears, click **Continue Anyway** to proceed with the driver installation.

Hardware Installation
The software you are installing for this hardware:
ATI Radeon Xpress 1200 Series
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

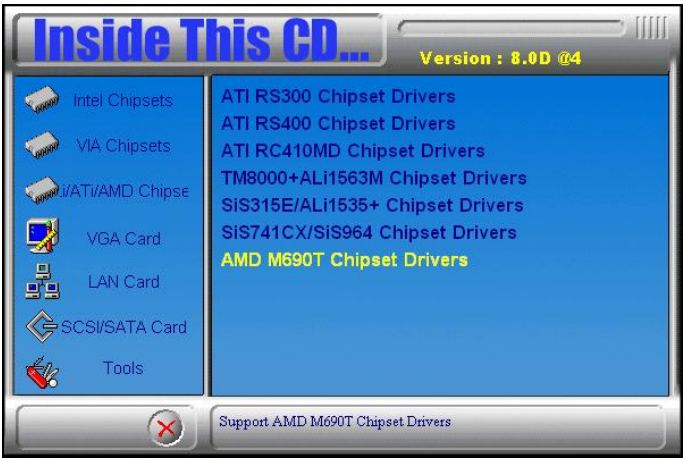
5. Setup is now complete. Click **Finish** to restart the computer and for changes to take effect.

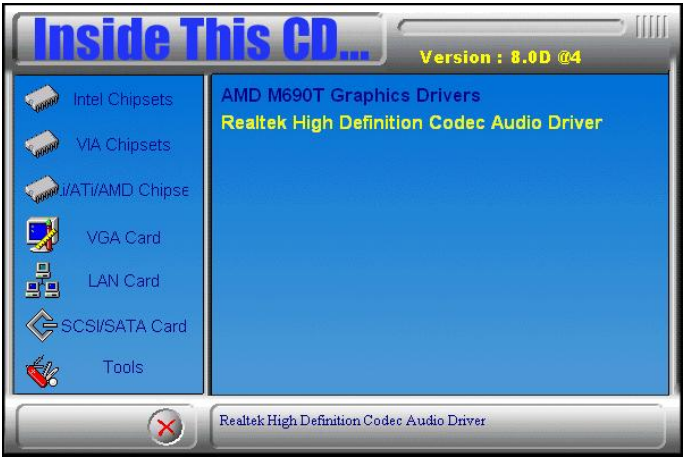
Realtek Codec Audio Driver Installation

Follow the steps below to install the Audio Drivers.

1. Insert the CD that comes with the motherboard. Click ***AMD M690T Chipset Drivers***. Then, select **Realtek High Definition Codect Audio Driver**.

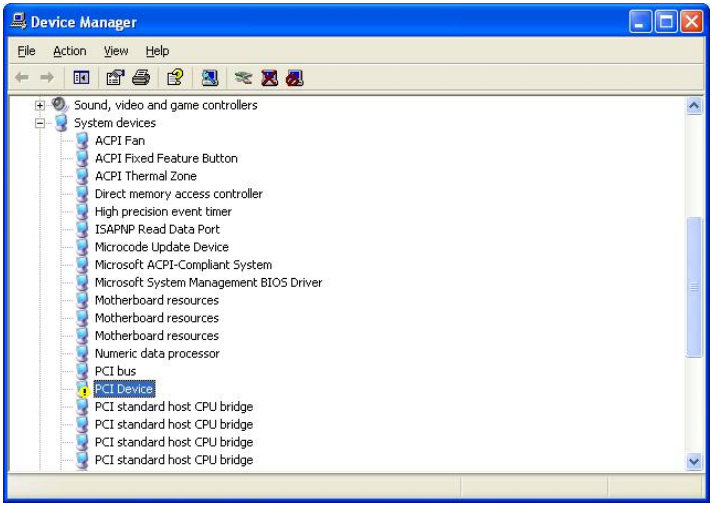
2. Click ***Realtek AC'97 Codec Audio Driver.***



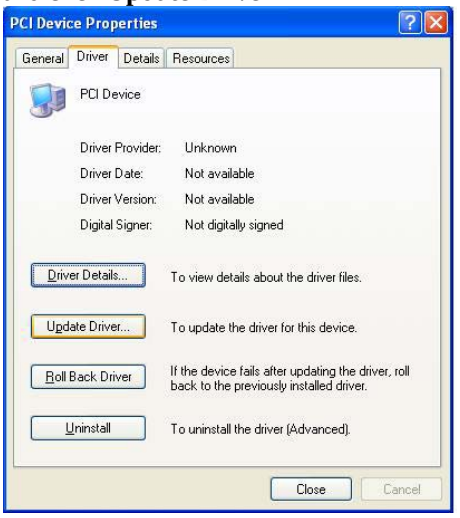


3. In the **Welcome** screen, click **Next** to continue. After the driver installation, click **Finish** on the next screen to restart the computer.

4. In the Windows operating system, go the the **Device Manager** window and click on **PCI Device** with the interjection mark as shown below.



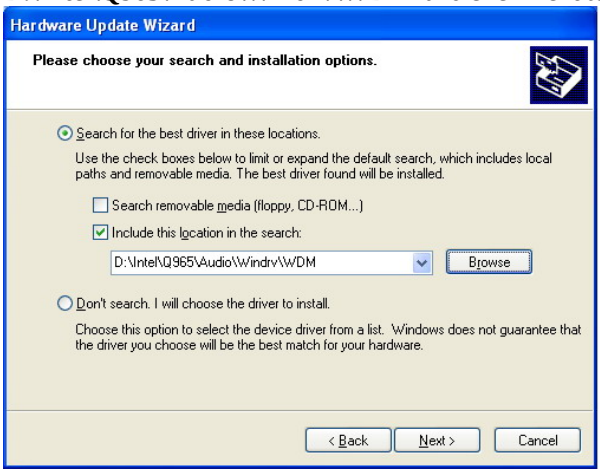
5. One in the **PCI Device Properties** window, click on the **Driver** tab, and click **Update Driver**


PCI Device Properties
General Driver Details Resources
PCI Device
Driver Provider: Unknown
Driver Date: Not available
Driver Version: Not available
Digital Signer: Not digitally signed
Driver Details...
To view details about the driver files.
Update Driver...
To update the driver for this device.
Roll Back Driver
If the device fails after updating the driver, roll back to the previously installed driver.
Uninstall
To uninstall the driver (Advanced).
Close
Cancel

6. In the **Hardware Update Wizard**, select **No, not this time**, and click **Next**.

Hardware Update Wizard
Welcome to the Hardware Update Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

7. In the next screen, the wizard will help you install software for 'PCI Device'. Select **Install from a list or specific location (Advanced)** and , and click **Next** to continue. In the next screen (below), enter the location (if D drive is the source drive for the driver CD) as **D:\Intel\Q965\Audio\Windrv\WDM** and click **Next** to start installing.

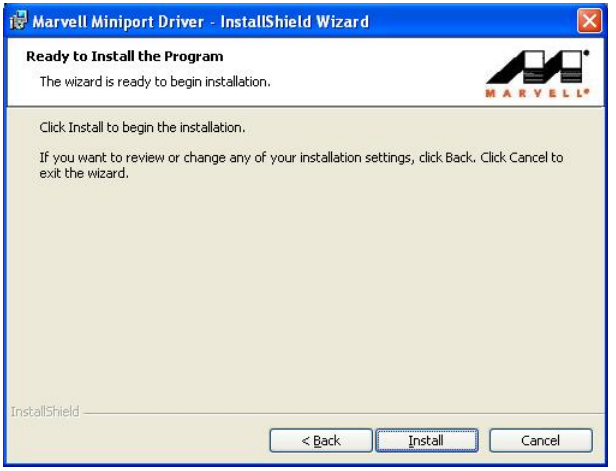

Hardware Update Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
D:\Intel\Q965\Audio\Windrv\WDM
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

8. The **Hardware Update Wizard Update** is now completed. Click **Finish** to restart the computer and for changes to take effect.

LAN Drivers Installation

1. Insert the CD that comes with the motherboard. Click ***LAN Card*** on the left side and click **Marvell LAN Controller Driver**.

2. When the Welcome screen of the **Marvell Mini port Driver – InstallShield Wizard** appears, click **Next** to continue. Then, in the next screen, choose **I accept the terms of the license agreement** and click **Next** to continue. Now, click **Install** to start begin the installation.


Marvell Miniport Driver - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
MARVELL
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

3. Installation is now complete, click Finish to exit the InstallShield Wizard.

Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:

```
//=============================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=============================================================================
#include <stdio.h>
#include <stdlib.h>
#include "W627EHF.H"
//=============================================================================
int main (int argc, char *argv[]);
void copyright(void);
void EnableWDT(int);
void DisableWDT(void);
//=============================================================================
int main (int argc, char *argv[])
{
        unsigned char bBuf;
        unsigned char bTime;
        char **endptr;

        copyright();

        if (argc != 2)
        {
                printf(" Parameter incorrect!!\n");
                return 1;
        }

        if (Init_W627EHF() == 0)
        {
                printf(" Winbond 83627HF is not detected, program abort.\n");
                return 1;
        }
        bTime = strtol (argv[1], endptr, 10);
        printf("System will reset after %d seconds\n", bTime);

        EnableWDT(bTime);

        return 0;
}
//=============================================================================
```

```
void copyright(void)
{
        printf("\n======== Winbond 83627EHF Watch Timer Tester (AUTO DETECT) ========\n"\
                        "       Usage : W627E_WD reset_time\n"\
                        "       Ex : W627E_WD 3  => reset system after 3 second\n"\
                        "            W627E_WD 0  => disable watch dog timer\n");
}
//===========================================================================
void EnableWDT(int interval)
{
        unsigned char bBuf;

        bBuf = Get_W627EHF_Reg( 0x2D);
        bBuf &= (!0x01);
        Set_W627EHF_Reg( 0x2D, bBuf);                   //Enable WDTO

        Set_W627EHF_LD( 0x08);                          //switch to logic device 8
        Set_W627EHF_Reg( 0x30, 0x01);                   //enable timer

        bBuf = Get_W627EHF_Reg( 0xF5);
        bBuf &= (!0x08);
        Set_W627EHF_Reg( 0xF5, bBuf);                   //count mode is second

        Set_W627EHF_Reg( 0xF6, interval);               //set timer
}
//===========================================================================
void DisableWDT(void)
{
        Set_W627EHF_LD(0x08);                           //switch to logic device 8
        Set_W627EHF_Reg(0xF6, 0x00);                    //clear watchdog timer
        Set_W627EHF_Reg(0x30, 0x00);                    //watchdog disabled
}
//===========================================================================
```

```
//===========================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//===========================================================================
#include "W627EHF.H"
#include <dos.h>
//===========================================================================
unsigned int W627EHF_BASE;
void Unlock_W627EHF (void);
void Lock_W627EHF (void);
//===========================================================================
unsigned int Init_W627EHF(void)
{
	unsigned int result;
	unsigned char ucDid;

	W627EHF_BASE = 0x2E;
	result = W627EHF_BASE;

	ucDid = Get_W627EHF_Reg(0x20);
	if (ucDid == 0x88)
	{	goto Init_Finish;	}

	W627EHF_BASE = 0x4E;
	result = W627EHF_BASE;
	ucDid = Get_W627EHF_Reg(0x20);
	if (ucDid == 0x88)
	{	goto Init_Finish;	}

	W627EHF_BASE = 0x00;
	result = W627EHF_BASE;

Init_Finish:
	return (result);
}
//===========================================================================
void Unlock_W627EHF (void)
{
	outportb(W627EHF_INDEX_PORT, W627EHF_UNLOCK);
	outportb(W627EHF_INDEX_PORT, W627EHF_UNLOCK);
}
//===========================================================================
void Lock_W627EHF (void)
{
	outportb(W627EHF_INDEX_PORT, W627EHF_LOCK);
}
//===========================================================================
void Set_W627EHF_LD( unsigned char LD)
{
	Unlock_W627EHF();
	outportb(W627EHF_INDEX_PORT, W627EHF_REG_LD);
	outportb(W627EHF_DATA_PORT, LD);
	Lock_W627EHF();
}
```

```
//===========================================================================
void Set_W627EHF_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627EHF();
        outportb(W627EHF_INDEX_PORT, REG);
        outportb(W627EHF_DATA_PORT, DATA);
        Lock_W627EHF();
}
//===========================================================================
unsigned char Get_W627EHF_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_W627EHF();
        outportb(W627EHF_INDEX_PORT, REG);
        Result = inportb(W627EHF_DATA_PORT);
        Lock_W627EHF();
        return Result;
}
//===========================================================================
```

```
//===========================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//===========================================================================
#ifndef __W627EHF_H
#define __W627EHF_H                     1
//===========================================================================
#define         W627EHF_INDEX_PORT              (W627EHF_BASE)
#define         W627EHF_DATA_PORT               (W627EHF_BASE+1)
//===========================================================================
#define         W627EHF_REG_LD                  0x07
//===========================================================================
#define W627EHF_UNLOCK                          0x87
#define         W627EHF_LOCK                    0xAA
//===========================================================================
unsigned int Init_W627EHF(void);
void Set_W627EHF_LD( unsigned char);
void Set_W627EHF_Reg( unsigned char, unsigned char);
unsigned char Get_W627EHF_Reg( unsigned char);
//===========================================================================
#endif  //__W627EHF_H
```